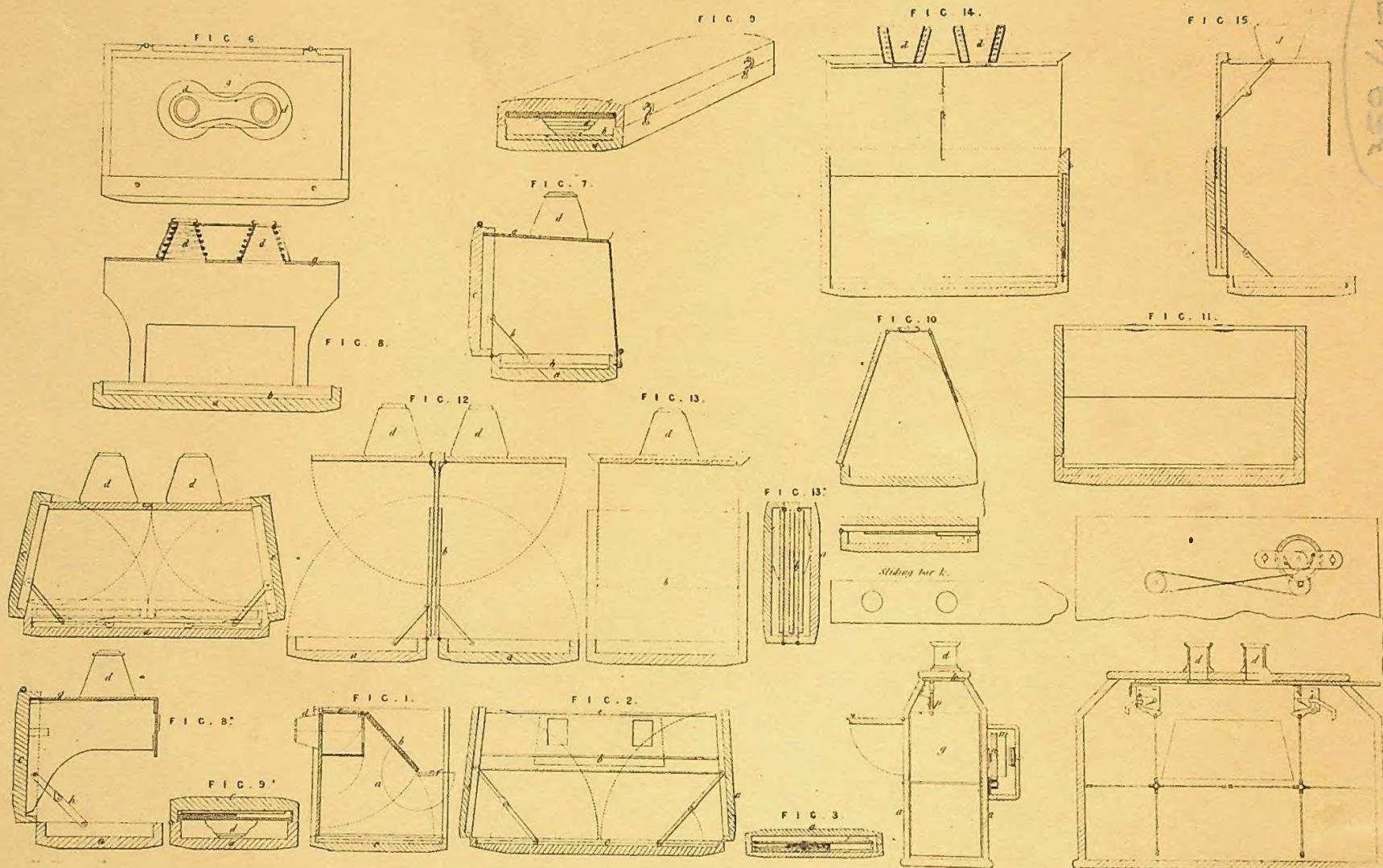


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88. OPTICS,  
Stereoscopes.



A.D. 1853 . . . . N° 711.

Stereoscopes.

LETTERS PATENT to Antoine François Jean Claudet, of Regent Street, in the County of Middlesex, Photographic Artist, for the Invention of "IMPROVEMENTS IN STEREOSCOPES."

Sealed the 20th May 1853, and dated the 23rd March 1853.

PROVISIONAL SPECIFICATION left by the said Antoine François Jean Claudet, at the Office of the Commissioners of Patents, with his Petition, on the 23rd March 1853.

I, ANTOINE FRANÇOIS JEAN CLAUDET, do hereby declare the nature of  
5 the said Invention for "IMPROVEMENTS IN STEREOSCOPES" to be as follows:—

This Invention of improvements in stereoscopes has for its object, firstly, the producing of pleasing and novel optical illusions; and, secondly, so constructing and combining the several parts of which the  
10 instrument is composed that it may be collapsed and brought into a small compass, so as to be rendered more conveniently portable than ordinary rigid instruments.

One of the optical illusions which I propose to produce by means of the first part of my improvements is effected by adapting to the interior of the  
15 stereoscope a mirror or looking glass, in which the picture, when placed

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at the bottom of the instrument, as usual, is reflected, so that when an object, say, for instance, a portrait, is observed through the lenses, the person represented will be seen in a natural position and not reversed; the mirror is placed at an angle of 45 to the plane of the picture, and the lenses or eye pieces must therefore be placed at the back instead of 5 at the top of the stereoscope; so that the line of sight is parallel with the plane of the picture, and the angle of incidence being equal to the angle of reflection, as is usually the case. Another improvement, which may be used in conjunction with the above, consists in the adaptation to the eye pieces of a sliding piece, which has holes or apertures made 10 therein, and so arranged that first one eye piece and then the other may be closed. The pictures, instead of being made simply stereoscopic in the well-known manner, are made so as to shew various actions; for instance, to represent a man taking off and putting on his hat, one picture must me made with the hat on, and the other with the hat off 15 and in the hand. Upon observing the two pictures together in the stereoscope, and moving the slide of the eye pieces backwards and forwards, the figure will appear as if he were taking off his hat. A variety of other illusions of moving figures, as dancing figures, athletoe, boxing matches, &c., may be made. An increased effect and great 20 variety will be produced by combining a number of pictures together in the form of a cross, so arranged as to exhibit two pictures only together. Two series of pictures arranged in crosses must be employed, and the crosses so made are mounted on centres in the body of the stereoscope, and are actuated by the moving slide of the eye piece, which, by means 25 of a lever and click and ratchet wheels, will cause the crosses to turn alternately, and present pictures of different figures, or the same figure in different positions. The moving parts may be actuated by clock-work, or other self-acting mechanism, so that the different changes in the attitude of the figures will take place without the assistance of the 30 observer. The instruments, with my improvements attached to them, may be made either rigid, as is usual, or put together in such a manner as to admit of their collapsing or folding for the purpose of shutting up into a small compass. A variety of plans may be devised for enabling the instruments to be folded up, and some of them I propose to con- 35

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struct in such a manner that immediately the fastening, which holds the instrument in a closed state, is undone, all the parts will be at once made to assume their proper position for viewing a picture. One of the simplest arrangements consists in mounting the eye pieces in a flat 5 bar attached to a flap which is hinged to the lid of a box, which may form part of the case of a stereoscope picture. The hinged flap has openings made therein immediately below the lenses for the purpose of looking through, and is provided with an overhanging piece for partially excluding the light; the lid of the box is prevented from opening 10 too far by means of a strap, which holds it up at right angles from the bottom; the hinged flap, which carries the eye piece bar, is also supported in a line parallel with the bottom of the case (and therefore with the picture) by means of one or more vertical supports. When the lid of the case is lifted up, the eye piece bar at one rises into its 15 proper position by the force of an elastic strap or India-rubber spring. By the above arrangement I am enabled to get a complete stereoscope into a case about 6 inches long, 3 inches wide, and  $\frac{1}{2}$  inch thick; the case may be made to open either like a book, the hinges being at one side; or, by somewhat modifying the internal construction, it may 20 be made to open from the middle, like a pair of folding doors, the hinges in this case being at each end. Another form of making the instrument consists in attaching the eye pieces to two flaps, which have holes to look through made therein, and are hinged to a central vertical partition, which is made moveable in a vertical guide, so that it may be 25 moved up or down for the purpose of altering the focus when required. In this instance the lenses are mounted in cells attached to the upper ends of flexible tubes, which are kept extended by means of coiled or spiral springs when not compressed in the case or box. The sides of the box are hinged to the fixed central part, and when the hook 30 or fastening which keeps them closed is undone the pressure of the coiled springs of the eye pieces will force the sides down into a horizontal position, and at the same time cause the hinged flaps to be raised into a horizontal position by India-rubber or other elastic springs. It will now be understood that when the clasp or fastening which keeps 35 the sides of the case closed is unfastened, all the several parts will at

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once spring into their proper position for viewing the pictures, without any assistance from the observer. These plans of constructing portable stereoscopes may be considerably varied. I do not intend, therefore, to confine myself rigidly to these precise arrangements, which will be found to possess the same principle of construction, although carried out in a 5 somewhat different manner, viz., that all the parts are connected together, and all fold up and lie in one case, the top and bottom of which forms part of the instrument.

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**SPECIFICATION** in pursuance of the conditions of the Letters Patent,  
filed by the said Antoine François Jean Claudet, in the Great Seal 10  
Patent Office, on the 23rd September 1853.

**TO ALL TO WHOM THESE PRESENTS SHALL COME,** I,  
ANTOINE FRANÇOIS JEAN CLAUDET, of Regent Street, in the County of  
Middlesex, Photographic Artist, send greeting.

**WHEREAS** Her most Excellent Majesty Queen Victoria, by Her 15  
Letters Patent, bearing date the Twenty-third day of March, in the  
year of our Lord One thousand eight hundred and fifty-three, in the  
sixteenth year of Her reign, did, for Herself, Her heirs and successors,  
give and grant unto me, the said Antoine François Jean Claudet, Her  
special licence that I, the said Antoine François Jean Claudet, my 20  
executors, administrators, and assigns, or such others as I, the said  
Antoine François Jean Claudet, my executors, administrators, and  
assigns, should at any time agree with, and no others, from time to  
time and at all times thereafter during the term therein expressed,  
should and lawfully might make, use, exercise, and vend, within the 25  
United Kingdom of Great Britain and Ireland, the Channel Islands,  
and Isle of Man, an Invention for "IMPROVEMENTS IN STEREOSCOPES,"  
upon the condition (amongst others) that I, the said Antoine François  
Jean Claudet, by an instrument in writing under my hand and seal,  
should particularly describe and ascertain the nature of the said Inven- 30  
tion, and in what manner the same was to be performed, and cause  
the same to be filed in the Great Seal Patent Office within six calendar

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months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Antoine François Jean Claudet, do hereby declare the nature of my said Invention, and in what manner 5 the same is to be performed, to be particularly described and ascertained in and by the following statement, reference being had to the drawings hereunto annexed, and to the letters and figures marked thereon (that is to say) :

This Invention of "IMPROVEMENTS IN STEREOSCOPES" has for its object, 10 firstly, the producing of pleasing and novel optical illusions by means of a peculiar construction and arrangement of some of the parts, which are made moveable so as to impart to the picture the appearance of moving figures.

My Invention consists, secondly, in so constructing and combining 15 the several parts of which the stereoscope is composed that the instrument may be collapsed and brought into a small compass, so as to be rendered more conveniently portable than ordinary rigid stereoscopes. One of the optical illusions which I propose to produce by means of 20 the first part of my improvements is effected by adapting to the interior of the stereoscope a mirror or looking glass, in which the picture, when placed at the bottom of the instrument, as usual, is reflected, so that when the picture of any object, say, for instance, a portrait or a landscape, is observed through the lenses, the picture or person represented will be seen in a natural position, and not reversed, as is usually the 25 case. The mirror is placed at an angle of forty-five degrees to the plane of the picture, and the lenses or eye pieces must therefore be placed at the back instead of at the top of the stereoscope, so that the line of sight is parallel with the plane of the picture; and the angle of incidence being equal to the angle of reflection, the image is reflected 30 to the eyes by the inclined mirror. An instrument constructed on this plan is shewn at Figures 1, and 2, Sheet I., of the accompanying drawings. *a, a,* is the lid of the box or case of the instrument; *b, b,* is the mirror, placed at the proper inclination or angle to the bottom *c,* of the instrument, where the picture is to be placed. The eye pieces are shewn 35 at *d, d,* the line of sight being denoted by the horizontal dotted line.

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A lid or shutter at *e*, and another one at *f*, are hinged to the mirror for the purpose of shading out extraneous light, and to prevent the reflection of surrounding objects in the mirror. Instruments constructed on this principle may either be made rigid or collapsible, as shewn in the drawing. As the mode of rendering the instrument collapsible forms part of the second head of the Invention, it will be more fully explained hereafter.

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Another improvement, which has for its object the production of pleasing optical illusions, is shewn in Figures 4, and 5, and consists in the adaptation to the eye pieces of a sliding piece, which has holes or 10 apertures made therein, and so arranged that first one eye piece and then the other may be closed by moving the sliding piece backwards and forwards in its groove.

The pictures, instead of being made simply stereoscopic in the well-known manner, are made so as to show various actions; for instance, 15 to represent a man taking off and putting on his hat, one picture must be made with the hat on, and the other with the hat off and in the hand.

Upon looking in the stereoscope, and moving the slide of the eye pieces backwards and forwards, the figure will appear as if he were 20 taking off his hat.

This is the most simple form of stereoscope, to produce this kind of illusion, which is effected by alternately opening and closing first one and then the other aperture for the eyes, the action for so doing being so quick as to be scarcely perceptible to the eye of the observer. A 25 variety of other illusions of moving figures, as dancing figures, athletæ, boxing matches, may be made. An increased effect and great variety will be produced by combining a number of pictures together in the form of a cross, so arranged as to exhibit alternately under each eye from different positions, so that the observer may, in succession, see eight 30 different pictures, all in different attitudes. By this means the change in position or attitude of the figures will not appear so sudden and so abrupt as when only two pictures are exhibited.

The two series of pictures arranged in crosses must be employed, and the crosses are mounted on centres in the body of the stereoscope, 35

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and are actuated by a coiled spring, which must be wound up occasionally for that purpose.

Fig. 4, is a longitudinal vertical section of a stereoscope constructed upon the plan just described; and Fig. 5, is a transverse vertical section of the same; *a, a*, is the case of the instrument; *d, d*, the eye pieces; *g, g*, are a pair of crosses, each composed of four pictures representing the figures, say two boxers in different attitudes; these crosses are mounted on centres which turn in holes made in the sides of the case. Each of the axles of these crosses carries a pulley *h*, which is worked by means of a band driven by gearing *n*, which is rotated by a coiled spring, enclosed in a closed box *m*. The crosses *g, g*, are locked in their required positions by means of catches *p*, which are raised out of contact with the crosses by the sliding bar *k*, to permit of the action of the spring.

15 This sliding bar *k*, has two holes made in it, for the purpose of closing or obscuring the apertures of each of the eye pieces alternately.

It will now be seen that if the observer, while he is looking through the eye pieces at the pictures, will move the sliding bar *k*, the driving band of the pulleys will cause the crosses to rotate, and thus every time 20 the bar *k*, is moved backwards a different picture will be presented under one or other of the apertures.

The instrument with some of my improvements attached to them, may be made either rigid, as is usual, or put together in such a manner as to admit of their collapsing or folding for the purpose of shutting 25 up into a small compass.

In Figures 1, 2, and 3, already referred to, I have shewn my improved reflecting or mirror stereoscope, constructed in such a manner as to be collapsible; *a, a*, are the lids of the case; *c, c*, the bottom thereof; the eye pieces *d, d*, are collapsible, being furnished with a 30 helical spring internally, and are attached to a flap *g*, which is hinged to the bottom *c*. The mirror *b*, is connected by the lid *e*, to the top edge of the flap *g*, and when the stereoscope is closed as shewn at Fig. 3, the parts *e*, and *b*, fold flat against the part *g*, and the part *f*, against the back of the mirror *b*. The parts *a*, are sustained in their 35 place by means of the struts *h*, and the other parts are held up by means of suitable catches as shewn.

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A variety of other plans may be devised for enabling the instruments to be folded up, and some of them I propose to construct in such a manner that immediately the fastening which holds the instrument in a closed state is undone, all the parts will be at once made to assume their proper position for viewing a picture. One of the simplest 5 arrangements consists in mounting the eye pieces in a flat bar attached to a flap, which is hinged to the lid of a box, which may form part of the case of a stereoscope picture.

This construction is shewn in Figures 6, 7, 8, and 9; *a*, is the lid of the box; *c*, the bottom in which the stereoscopic picture *b*, is to be 10 placed. The eye pieces *d*, *d*, are attached to the flap *g*. The horizontal flap *g*, is supported by the vertical flap *f*, which is held in its place by the hooks and eyes *i*, *i*.

Fig. 6, is a plan view of the stereoscope. Fig. 7, is a cross section. Fig. 8, is a longitudinal section of Fig. 7, looking to the right hand, 15 and Fig. 9, is a perspective view of the instrument closed, one of the ends thereof being removed to shew the interior.

The hinged flap *g*, has openings made therein immediately below the lenses for the purpose of looking through, and is provided with an overhanging piece, for partially excluding the light and preventing it 20 from falling on the daguerreotype plate, at an angle which would correspond with the angle of reflection; the lid of the box is prevented from opening too far by means of straps or bars *h*, *h*, which hold it up at right angles from the bottom; the hinged flap which carries the eye piece bar is also supported in a line parallel with the bottom of the 25 case (and therefore with the picture). When the lid of the case is lifted up the eye piece bar at once rises into its proper position by the force of an elastic strap or India-rubber spring, which is attached to it at the part where it is connected with the lid of the box.

By the above arrangement I am enabled to get a complete stereo- 30 scope into a case about six inches long, three inches wide, and half an inch thick; the case may be made to open either like a book, the hinges being at one side, or, by somewhat modifying the internal construction, it may be made to open from the middle like a pair of folding doors, the hinges in this case being at each end.

Fig. 8\*, is a cross section, and Fig. 9\*, a longitudinal section of a

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modification of the above. In this instance the flap *g*, is supported by a central partition, which when the flap is lifted up at once springs into its proper position by the elasticity of an India-rubber spring.

Fig. 10, is a cross section, and Fig. 11, a longitudinal section of 5 another modification of the above; the principal difference being in the external form, by adopting which the collapsible eye pieces may be dispensed with, as the case in this instance will not interfere with the nose of the observer.

Another form of making the instrument consists in attaching the 10 eye pieces to two flaps, which have holes to look through made therein, and are hinged to a central vertical partition, which is made moveable in a vertical guide, so that it may be moved up or down for the purpose of altering the focus when required.

An instrument constructed on this plan is shewn in section at 15 Figures 12 and 13; *a, a*, is the bottom, which is hinged to a central partition *b, b*. In this instance the lenses are mounted in cells attached to the upper ends of flexible tubes *d, d*, which are kept extended by means of coiled or spiral springs when not compressed in the case or box. The sides of the box which when the instrument is opened from 20 the bottom are hinged to the fixed central part *b, b*; and when the hook or fastening which keeps them closed is undone, the pressure of the coiled springs of the eye pieces will force the sides *a, a*, down into a horizontal position, as shewn in Fig. 12, and at the same time cause the hinged flaps *g, g*, to be raised into a horizontal position by India-rubber 25 or other elastic springs. It will now be understood that when the clasp or fastening which keeps the sides of the case closed is unfastened, all the several parts will at once spring into their proper position for viewing the pictures, without any assistance from the observer. In order to adjust the eye pieces to the focus of the observer the central 30 bar *k*, to which the flaps *g, g*, are attached, may be drawn up and down in the groove of the central partition *b, b*, as shewn in the drawing.

Fig. 14, is a longitudinal section, and Fig. 15, a transverse section of a modification of the above; the principal difference being that the top or lid opens in the same manner as in Figures 7, 8, and 9, and is 35 not divided as in Figures 12 and 13. In order to steady the flap *g*,

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which carries the eye pieces, I have adopted struts *h*, thereto, and also an overhanging flap *f*, to shade over the glare of light.

These plans of constructing portable stereoscopes may be considerably varied. I do not, therefore, intend to confine myself rigidly to the precise arrangements, which will be found to possess the same principle of construction, although carried out in a somewhat different manner, viz<sup>t</sup>., that all the parts are connected together, and all fold up and lie in one case, the top and bottom of which form part of the instrument.

Having now described my improvements in stereoscopes, and the best means with which I am at present acquainted for carrying the same into effect, I claim, in conclusion,—

First, the application to stereoscopes of mirrors or reflectors placed (above the picture or object to be viewed) at such an angle or inclination as will allow the object or picture to be reflected therein, so that it may be seen by the observer in a natural or non-inverted position, as above described.

Second, I claim the adaptation to the eye pieces of stereoscopes of a sliding bar, perforated with holes in such a manner that each of the eye pieces or apertures for the eyes may be alternately closed or obscured by moving the sliding bar backwards or forwards, so that when two or more pictures or representations of living or moving objects in different attitudes or positions are presented to the eyes of the observer alternately or in succession, an optical illusion, having the effect of apparently moving objects, may be produced.

Third, I claim arranging around a central shaft or axle pictures or representations of living or moving figures or objects shewn in different attitudes and positions as above described, and so mounting them on the said shafts or axles that they may in succession be brought beneath or in view of one or other of the eyes of the observer, so as to produce pleasing optical illusions. I also claim connecting the sliding bar of the eye pieces with the rotating shafts or axles on which the pictures are mounted, so that both these parts may be made to act simultaneously.

Lastly, I claim the several plans herein shewn and described for so

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constructing or arranging the several parts of stereoscopes that they may be collapsed or folded together into a small space when not in use. I claim particularly the plans shewn for causing either all or certain of the parts of stereoscopes to rise into their proper position  
5 ready for use immediately the instrument is opened.

In witness whereof, I, the said Antoine Jean François Claudet,  
have hereunto set my hand and seal, the Twenty-third day of  
September, in the year of our Lord One thousand eight  
hundred and fifty-three.

10

A. CLAUDET. (L.S.)

Witness, JAMES ELLIOTT.

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